

## **IMPROVED BEVERAGE CARTON**

### **FIELD OF THE INVENTION**

This invention relates to cartons for the packaging and distribution of articles such as beverages in primary containers such as bottles or cans although other containers could be handled. More particularly it relates to such cartons which are top opening for extraction of the enclosed containers.

### **BACKGROUND OF THE INVENTION**

The provision of packaging for the distribution of bottled or canned beverages such as soft drinks or, particularly, beer is a major aspect of the beverage manufacturing industry and there are various problems associated therewith. To summarize, the carton should be of low cost consistent with adequate protection of its contents. It should be provided to the beverage manufacturer in a compact form which is easily and conveniently erectable in high-speed equipment for reception of the bottles of beverage. It should also be susceptible to the most convenient and least costly form of loading with the bottles of beverage. Many cartons at present in use are of the top loading type that is, the top wall of the carton is constituted by side and wall flaps which, in the empty carton when erected, are open to permit dropping from above of the bottles into the compartments of the carton from above. Obvious care must be taken to accurately position the carton to receive the bottles and avoid breakage of the bottles as they drop into the carton. An example of such a carton is described in Canadian Patent No. 745,492. Another and increasingly common form of carton, especially for containing smaller numbers of

bottles such as 6 or 12, is called an "end-loader" and a number of these are known in the prior art. Conceptually, such cartons when assembled for filling are essentially a generally rectangular cross-sectioned tube or sleeve into which the filled bottles are inserted from an end and then the ends are secured to seal in the bottles. However, such containers have suffered from one or more defects such as being of relatively complex and expensive construction; having a lack of adequate strength especially at the handle arrangement location; or they incorporate "throwaway" components such as tear strips which are undesirable from an environmental point of view, - refer for example to Canadian Patent No. 890,273. Such tear strips and also bottle access opening panels are formed in the board material from which the carton is made and are defined by a line of perforations or other forms of weakening. Essentially, they are already partially severed from surrounding material from which they are formed. Also, many cartons have lines of weakness at the join of the top wall and a sidewall and it had been found that, during transit when filled with bottles or cans, pressure exerted against the sidewall can, and does, produce premature rupturing of such lines of weakness. The overall package is then not only unsightly but also cannot be sold. The integrality of the carton constitutes part of the product integrity since many of the enclosed primary containers especially beverage bottles, may not separately be considered secure. Moreover, at least in Canada, all such cartons must, following opening, be sufficiently structurally sound to be able to be used to enclose the empty bottles for return to the beverage manufacturer or other recycling facility. Moreover, they cannot be stacked as required in during transit and in many retail stores and their storage areas.

In modern production facilities, it is essential that the cartons which are received in a collapsed or "knocked-down" condition from the carton manufacturer are able to be rapidly and consistently erected using high speed equipment; any failures in doing so results in production

line stoppages which are very expensive. A common problem is that the force applied to the carton to erect it can, and does, result in lines of weakening such as perforations prematurely severing resulting in a tear strip or panel being raised out of the plane of the carton thereby fouling the equipment. Refer for example to the end loading carton described in Canadian Patent Nos. 740,309 and 741,189 where, as is typical, the top panels are secured along their longitudinal edges to associated side walls via fold lines which are also lines of perforations. This allows the top panel to be ripped off to open the case. This is a consistent problem as there is constant pressure to reduce the cost of cartons which can mean using less and/or less expensive materials which can increase the risk of failure.

It is an objective of the present invention to provide a top-opening secondary container for beverages in primary containers such as bottles or cans which secondary container is of low cost to manufacture and can conveniently and rapidly set up from a collapsed condition preferably using presently available equipment.

It is another objective of the present invention to provide such a container wherein lines of weakness defining an opening for the removal of filled primary containers is less prone to premature rupturing.

### **SUMMARY OF INVENTION**

The present invention provides a carton having a generally rectangular top wall connected via first folds or joints to a pair of opposing sidewalls and via second joints or folds to a pair of opposing end walls. The top wall has a readily severable panel which, when removed, provides access to items, e.g. bottles, in the carton. The usually rectangular panel is defined by two lines of weakness, one located parallel to and spaced from each of the first joints or folds. These lines

extend from one of said second joints or folds to a third line of weakness lying parallel to and spaced from said second joint or fold and which connects said two lines of weakness.

Consequently, upon severing the lines of weakness three edges of the panel are freed from the board making up the carton top wall and the panel is able to rotate about the second fold out of the plane of the top wall and thereby provide access to the carton contents.

In one aspect therefore, the present invention provides a carton for beverage containers comprising a unitary blank of sheet material having fold lines serially defining in a laterally aligned relationship a top wall, a first side wall, a bottom wall and a second side wall, said top wall and said second side wall being adapted to be secured to each other at a further fold line to form a sleeve having a generally rectangular cross-section, each of said walls having a flap at each end, which flaps are adapted to constitute carton end walls, said top wall having a severable panel defined by two lines of weakness each extending parallel to and spaced from each of two joints between said top wall and said first and second side walls and from a joint of said top wall and an end wall to a further line of weakness extending laterally across said top wall.

Preferably the further line of weakness connects said two lines of weakness at a point intermediate between the joints between the top wall and the two end walls, thereby dividing the panel into two section and the two lines of weakness may extend the full length of the top wall.

Preferably the further line of weakness connects the two lines at about a midpoint of the top wall thereby dividing said severable panel into two equal sections each extending from a joint between said top wall and opposing end walls.

In another aspect, the present invention provides a unitary carton blank comprising:

- (a) four rectangular walls of the same length having their adjacent longitudinal edges serially connected via first fold lines, an outermost free longitudinal edge of each of

two or said outer walls being adapted to be connected via another first fold line so as to form a tubular carton having a generally rectangular cross-section;

- (b) an end flap connected to a second fold line to each end of each saw panel, and adapted to form end walls in an erected carton;
- (c) one of said walls which forms a top of the carton when erected being provided with a severable panel defined by lines of weakness, two of which are parallel to each other and to said first fold links and each is spaced from an adjacent first fold line, both lines extending from a same fold line joining said top wall to an end flap to a third line of weakness is generally parallel to said second fold line and spaced therefrom.

It is preferred that the blank is made of a corrugated board having flutes parallel to said third line of weakness. Also that the two lines of weakness extend the full length of said top wall and especially that the third line of weakness is located about the midpoint of said top wall.

Finally it is preferred that the two lines of weakness are spaced from said first fold lines by about 1 - 2 cms and that the blank is provided with a hand hole in one end wall thereof.

The present invention will be further described but not limited by the preferred embodiment described with reference to the attached drawings in which:

**FIG. 1** is a plan view of a one-piece carton blank according to the present invention.

**FIG. 2** is an angled perspective of the blank of **FIG. 1** formed into the tubular carton but in a “knocked-down” or flat condition.

**FIG. 3** is an angled perspective view of a generally rectangular cross-section tubular carton set-up from the blank of **FIG. 1**, the carton having two adjacent access panels.

**FIG. 4** is a perspective view of the carton of **FIG. 3** filled with bottles and having one of the two access panels partially severed from the top wall thereby providing access to carton contents.

**FIG. 5** is a perspective view of another embodiment of a carton of the present invention which has a single access panel shown in the process of being severed from the top wall; and

**FIG. 6** is a cross-section through a piece of corrugated board which is preferably used according to the present invention.

Turning to the drawings and in particular **FIG. 1**, a carton blank generally designated 10 comprises four rectangular walls 12, 14, 16 and 18 serially connected at fold lines 22, 24 and 26. Connected to wall 18 along its outermost edge via fold line 28 is edge or glue tab 30. Connected to walls 12, 14, 16 and 18 via second fold lines 32, 34, 36 and 38 are respectively, end panels 13a and 13b; 15a and 15b; 17a and 17b and 19a and 19b. Wall 18 constitutes the top wall in a carton formed from this blank and as such, it is provided with an opening 40 to obtain access to the carton 32 contains. The opening 40 is initially sealed with severable panel generally designated 44 which is divided into two equal sections 42a and 42b. Panel 42 is defined by lines of severable perforations 44a and 44b and 46. These lines of perforations are not of the same type. Line 46 is composed of large slits about 1.75 cm through the board material, adjacent slits being divided by a small piece, about 0.4 cm, of board whereas lines 44 are composed of L shaped, about 1.5 cm x 0.5 cm slits through the board, the length of board remaining between adjacent slits being relatively large - about 1 cm. It should be noted that where lines 44 and lines 36b meet fold line 38, they do so at an angle as does perforation line 46 when it contacts perforation lines 44a and 44b. This feature assists when severing or separating panels 42a and 42b from the remainder of top wall 18 by smoothly facilitating the rupturing of the board remaining in the lines of perforations in the board as the tear is propagated around panels 42a

and 42b and obstructs any tendency for the tear to cross fold lines 26 and 38. Edge tab 30 is provided on one side, with glue which is used to secure panels 18 and 12 together to form the desired tubular carton - refer especially to **FIG. 3**. The end panels 13a, 15a, 17a and 19a are folded inward and bonded to each other in known manner. (refer for example to Canadian Patent No. 1,297,851) to form the end wall 56. Note there is no need to provide for the alignment of the walls of the carton because the walls are automatically aligned as a result of the one-piece construction. The blank is made of rotary die cut corrugated board with the following material characteristics:

outside liner	150 gm
medium	127 gm
inside liner	127 gm

The orientation of the corrugated medium is very important. In this embodiment, it extends laterally throughout the blank. Consequently, line of perforations 46 has the same orientation and, with the relatively severe type of perforation, it is relatively easy for the consumer to complete rupture of that line by the insertion of a hand through that line 46 into the interior of the carton and then complete the severance of lines 44 which entails clearing the board across the medium corrugations. It should also be noted that line of perforations 46 is located between two lateral rows of bottles in the filled container. Consequently the hand can readily pass through the line of perforations into the void below between the bottle necks a distance sufficient to enable the fingers to grip the new free edge 43 of panel 42b and pull upwardly.

The corrugated board material used in forming the blank of **FIG. 1** and the cartons of **FIGS. 3 - 5** is shown in detail in **FIG. 6**. It is made up of an outside line 60, an inside liner 62 with a corrugated sheet or medium 64 interposed there between, flutes 66 being thereby formed

between the liners 62 and 64 and the corrugated sheet 64. Line of weakness 46 is oriented in the direction of arrow A and lines of weaknesses 44a and 44b in the direction of arrow B.

Turning to **FIG. 3**, this shows the blank of **FIG. 1** duly erected by gluing tab 30 to the inside or lower outermost strip (not shown) of side wall 12. The result is the tubular carton or sleeve denoted 50 in **FIG. 3**. This is an end loader i.e. the carton contents, in this case bottles of beer, are inserted into the container through an open end 52 and the end panels 13a, 13b; 15a, 15b; 17a, 17b; and 19a, 19b are secured to each other in the usual well known manner to form end walls 54 and 56 - refer **FIG. 4** which shows the now filled carton 50. **FIG. 4** also shows in (exaggerated) detail the differing types of perforation used in line of weakness 46 - long through slit 45 separated by a thin strip 47 of board material versa L-shaped through slits 49 separated by a slightly thicker strip of board material.

As stated above, the carton 50 is usually supplied to the beverage manufacturer, in this case a brewery facility, in a “knocked down” or “flat” i.e. the blank of **FIG. 1** formed into its tubular or sleeve form by securing tab 3b to the inner surface of wall 12 as shown in **FIG. 2** but the carton is in its collapsed or flat form. This makes for economical transport etc. When needed at the brewery the flat is erected by commercially available equipment, initially to the form shown in **FIG. 3** by applying pressure in the direction of arrows C and D.

Subsequently, bottles filled with beer are inserted into the carton again using readily commercially available equipment which also effects folding and bonding together of the associated end walls so as to form the end walls and complete the packaging of the beer.

The sealed 4 x 3 package is shown in **FIG. 4** with one of the two product access panels 42b being shown in its open position. To effect opening of the panel, the fingers of a hand push



down on the line of weakness 46 - refer **FIG. 3**. As indicated above, this is adapted to give way or separate without undue force and the fingers easily effect the break of the line of perforations and extend into the void between the necks of the rows of bottles in the carton and is able to grasp the outermost part or edge 43 of panel 42b. Subsequently, pulling back on part 43 of panel 42b results in the severing of lines of perforations 44b until panel 42b is totally free and rotates to take up the position shown in **FIG. 4**. The same procedure results in panel 42a being freed from top panel 18 and being rotatable around its associated joint 38a to provide access to the bottles in the other half of filled carton 50.

It should be noted that, since lines of weakness 44a and 44b are spaced a little, in this case about 1 - 1.5 cm from the upper edge - of side wall 12 and 16 respectively, a small strip 51 of board material is left in place extending for the length of carton 50. This may assist in providing some structural strength to the carton when it is re-used to take the emptied bottles back to the brewery or other collection facility. Since panels 42a and 42b extend to fold lines 38, there is no corresponding strip across the top of each end wall 54 and 56. This provides for more convenient accessibility for extraction of the bottles located in the corners of carton 50. Formed end wall 56 is provided with a potential hand hole 21 defined by side slits 23, and bottom slit 25 and hinge line 27. Smaller cartons, such as those for 6 (e.g. a 3 x 2) or 12 (e.g. 3 x 4) bottles of beer will have only one such handhole whereas larger cartons or different carton configurations may have two usually opposing handholes. To form the handhole, the fingers of one hand press against the board material just above line 25 where the slits or perforations forming line 25 and 23 are severed, the board material rotates about lines 27 and 25 and folds upward about line 27 and the whole section rotates inwardly about line 29 so as to lie inside the carton and adjacent the inner surface of side wall 56.